



UNIVERSITI PUTRA MALAYSIA

**CONSUMERS' PERCEPTIONS, ATTITUDES AND WILLINGNESS TO
PAY TOWARDS CHEMICAL FREE PRODUCE : THE CASE OF
VEGETABLE**

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**CONSUMERS' PERCEPTIONS, ATTITUDES AND WILLINGNESS TO PAY
TOWARDS CHEMICAL FREE PRODUCE: THE CASE OF VEGETABLE**

By

NOLILA BINTI MOHD. NAWI

**Thesis Submitted in Fulfilment of the Requirement for the
Degree of Master of Science in the Faculty of Agriculture
Universiti Putra Malaysia**

June 2001



This thesis is specially dedicated to my wonderful husband, Aziz Sham b. Saihen and my sweet baby boy Muhammad Aliff Firdaus, with love.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science.

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Chairman: Professor Mad Nasir Shamsudin, Ph. D.

Faculty: Agriculture

This study was aimed to determine consumers' perceptions, attitudes and willingness to pay (WTP) towards chemical free vegetable (CFV) produce. A total of 2258 respondents were interviewed using a close-ended questionnaire. Collected data was analysed using descriptive analysis, factor analysis and contingent valuation method (CVM). The results indicated that only a small percentage of consumers had ever consumed CFV although they had heard about it. The results also suggested that lack of knowledge was the main reason for the consumers not consuming CFV. Nutritional value was the most important factor that influences consumers' preferences in purchasing CFV, followed by freshness, health, taste and desire.

The factor analysis results identified six factors that influenced the purchasing of CFV among Malaysian consumers. The factors were awareness of chemical use, government involvement, health conscious, product availability, information awareness and product appearance.

The CVM was used to estimate consumers' WTP for CFV. A logit and probit model was used to determine consumers' WTP a premium for CFV. The results indicate that household income and price levels were the most important and significant factors that influenced and determined the amount of premium that a consumer is willing to pay for CFV.

Based on the study, it was found that at present CFV market is still a niche market, catering only a small segment of a whole vegetable market. Generally, Malaysians are still very reluctant to purchase CFV produce. Thus, to ensure a proper development of CFV market, there is a need to establish standards and certification programmes for CFV and to intensify Research and Development (R & D) to generate more cost effective production technologies for CFV.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains.

**TANGGAPAN, SIKAP DAN KESEDIAAN MEMBAYAR PENGGUNA
TERHADAP KELUARAN BEBAS BAHAN KIMIA: BAGI KES SAYURAN**

Oleh

NOLILA BINTI MOHD. NAWI

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Kajian ini adalah bertujuan untuk menilai faktor-faktor yang menentukan persepsi, sikap dan kesediaan membayar pengguna terhadap keluaran sayuran bebas bahan kimia. Sejumlah 2,258 responden telah ditemubual menggunakan soal-selidik tertutup. Data yang telah diperolehi telah dianalisis menggunakan analisis deskriptif, analisis faktor dan kaedah penilaian kontingensi. Keputusan yang diperolehi menunjukkan bahawa hanya sebilangan kecil sahaja pengguna yang pernah membeli sayuran bebas bahan kimia walaupun mereka pernah mendengar mengenainya. Keputusan yang didapati juga mencadangkan bahawa kekurangan pengetahuan yang cukup sebagai faktor utama yang menyebabkan pengguna tidak membeli sayuran bebas bahan kimia. Faktor lain yang turut mempengaruhi pengguna dalam pemilihan sayuran bebas bahan kimia ialah nilai nutrien, diikuti dengan kesegaran, kesihatan, citarasa dan keinginan.

Keputusan yang diperolehi dari analisis faktor telah mengenalpasti enam faktor yang mempengaruhi pembelian sayuran bebas bahan kimia dikalangan rakyat Malaysia. Faktor-faktor tersebut ialah kesedaran terhadap penggunaan bahan kimia, penglibatan

kerajaan, kesedaran kesihatan, kebolehdapatan produk, kesedaran informasi dan kerupaan produk.

Kaedah penilaian kontingensi telah digunakan untuk mengukur kesediaan membayar pengguna terhadap sayuran bebas bahan kimia. Kesediaan membayar pengguna diukur dengan menggunakan model logit dan probit. Keputusan kajian mendapati bahawa pendapatan keluarga dan harga sayuran merupakan faktor yang paling signifikan dalam menentukan kesediaan membayar pengguna.

Berdasarkan dari kajian ini, sayuran bebas bahan kimia didapati merupakan bidang pasaran yang hanya mewakili sebahagian kecil segmen dari seluruh pasaran sayuran di Malaysia. Secara amnya, rakyat Malaysia masih keberatan untuk membeli sayuran bebas bahan kimia. Justeru itu, untuk memastikan pembangunan pasaran sayuran bebas bahan kimia yang efektif, piawaian dan pensijilan adalah diperlukan. Seterusnya penyelidikan dan pembangunan untuk tujuan teknologi pengeluaran yang lebih efektif perlu ditekankan.

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I certify that an Examination Committee met on 5th June 2001 to conduct the final examination of Nolila binti Mohd. Nawī on her Master of Science thesis entitled “Consumers’ Perceptions, Attitudes and Willingness to Pay towards Chemical Free Produce: The Case of Vegetable” in accordance with Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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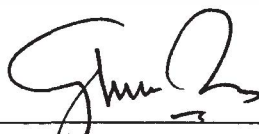
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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations, which have been duly acknowledgement. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.



NOLILA MOHD. NAWI

Date: 25 June 2001

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LIST OF ABBREVIATIONS

NAP2	Second National Agriculture Policy
NAP3	Third National Agriculture Policy
IMP2	Second Industrial Master Plan
FOA	Food and Agriculture Organisation
MADI	Malaysia Agricultural and Directory Index
HGV	Hydroponics Grown Vegetables
CRF	Certified Residue Free
CFV	Chemical Free Vegetable
WTP	Willingness to Pay
CVM	Contingent Valuation Method

CHAPTER I

INTRODUCTION

1.1 Vegetables Industry in Malaysia

Fresh-produced vegetable is a very important dietary component in the daily food intake of Malaysians. Vegetables are food crops that supply important sources of minerals, vitamins and fibers in their daily diet. More than 50 types of tropical and temperate vegetables are consumed locally, which form about 15 percent of the calorie intake of Malaysian. The Third National Agricultural Policy (NAP3) has placed an emphasis on the production of vegetables to meet domestic and export demand due to the increasing in population growth, higher incomes and nutritional deficiencies.

The vegetables industry is an integral component and comparatively profitable part of the agricultural sector in Malaysia. This dynamic industry provides raw materials to the domestic agro-based industry such as supplementary food for the population. In addition to the farmers' role, many businesses and millions of people are involved in processing, transporting and marketing; and in manufacturing and supplying of machines, seeds, fertilisers, pesticides and herbicides. At the same time, the vegetable industry also contributes towards conserving the ecology and environment as well as ensuring a sustainable development.

Vegetables are one of the four rising stars of Malaysian agriculture (the others being fruits, flowers and aquaculture), in which growth in production and income has been high and relentless in recent years. This has been partly, because of the rural –urban population drift. In the countryside, where much land is available, many families grow their own vegetables. But as they migrate to towns and stay in terrace houses and condominiums, there are fewer and fewer growers and more and more buyers of vegetables.

In the Sixth Malaysia Plan period, vegetable production recorded a moderate growth rate of 2.7 percent and growing at 5.8 percent per annum in the Seventh Malaysia Plan period. In 1995, vegetable production was estimated at 5.88 million tones. Its export value increased from RM66 million in 1990 to RM101 million in 1995. Singapore is the main and captive export market. In 1995, fresh vegetables valued at RM560 million was imported (Second Industrial Master Plan).

The prospects for vegetables are anticipated to be bright. Productions were increased to 1 million tones respectively in the year 2000, in order to meet the domestic and export demand. In the Second National Agricultural Policy (NAP2) Development Programs for Vegetables (1992-2010), the production will be expanded, diversified and upgraded. Production is expected to increase at 9.3 percent per annum and 7.1 percent per annum in the period 1991-2000 and 2001-2010 respectively, to reach 2.7 million tonnes by the year 2010. Specific areas including highlands will be identified and zoned as vegetable growing areas. Quality and standards including sanitary requirements will be emphasised.

In NAP3 (1998-2010), vegetable production will be expanded for local consumption and export purpose. Land, especially those near urban areas, will be zoned as permanent vegetable areas and leased to the private sector. Quality will be emphasised in the production with a niche products produced-pesticide-free and organic produce. Research and Development (R & D) efforts will be upgraded in cost-effective production, handling, storage and processing.

In view of limited suitable land, high value vegetables for both highland and lowland types will be pursued. Besides, all related agencies have been directed to increase their role, which include marketing, research and development, financial support, technical transfer and extension to overcome the problems of vegetable industry. However, the success and failure of development program will depend on the reaction of the farmers, as they have to make the final decision concerning the allocation of resources, and consequently the volume of vegetable production.

With the encouragement from the government, chemical free vegetables (CFV) product in Malaysia has a potential to compete with the production of conventionally produced vegetables. This study hopes to give a new dimension to CFV in the Malaysian market.

1.1.1 Vegetables Land Area

Vegetable growing is promoted on idle land, tin tailings and highlands in the government's program of in-situ development of land. It will be encouraged to be on a large scale and to adopt a commercial approach with linkages to the urban economy and markets.

Figure 1.1 shows the national areas of vegetables from 1990 to 1999. From 1990 to 1994, the areas increased quite steeply by 34.2 percent from 26,300 hectares to 35,300 hectares, then stagnated or declined a little. The period of 1990 – 1994 was a period of property boom, and as owners expanded beyond their previous boundaries, vegetable farms were encroached upon and displaced. Thus during the period, vegetable farms were disrupted with farmers having to seek new land. Therefore, there was a little increment in the area planted during that time.

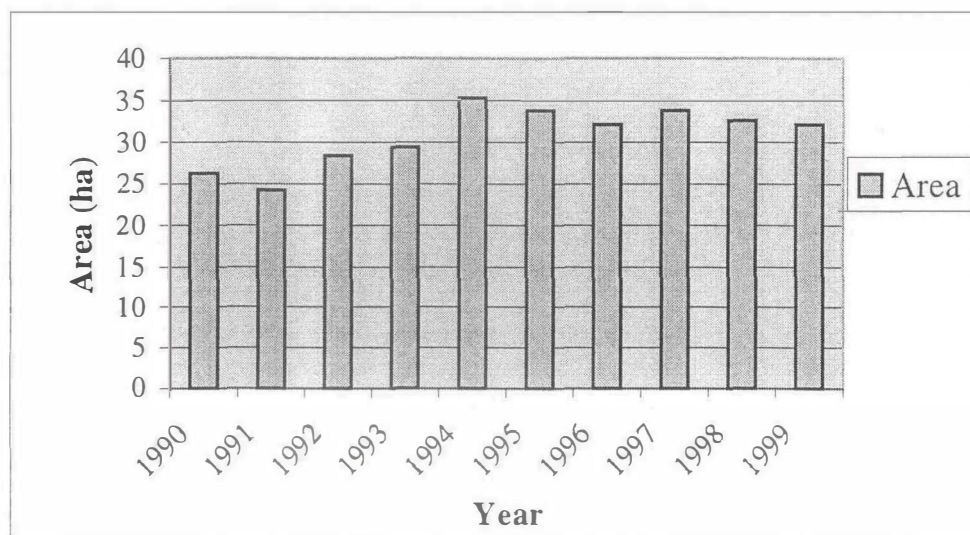


Figure 1.1: Area of Vegetables, Peninsular Malaysia ('000 hectareage)

The land used for vegetables in Peninsular Malaysia was 32,138 hectares in 1999; decline a little as compared to 32,601 hectares in 1998 (Figure 1.1). Table 1.1 shows the distribution of vegetables according to type in Peninsular Malaysia in 1999. Johore were the leading state for distribution of vegetable growing area with 14,378 hectares of the total area in Peninsular Malaysia while Pahang and Kelantan were next most important states with the area of 4,575 and 3,074 hectares respectively. The more populated states of Selangor (including Kuala Lumpur), Penang, Negeri Sembilan and Malacca were not the main producer of vegetable state in Peninsular Malaysia. This is because the land is too expensive to be used for farming.

Table 1.1: Hectareage of Vegetables according to States and Categories, Peninsular Malaysia 1999

States	Categories of Vegetables			Total Hectareage
	Leafy Vegetables	Fruit Vegetables	Root Vegetables	
Johor	8,076	6,118	184	14,378
Kedah	337	1,064	21	1,422
Kelantan	705	2,376	2	3,074
Melaka	656	359	-	1,015
Negeri Sembilan	375	445	3	823
Pahang	2,287	2,190	98	4,575
Perak	254	1,877	602	2,733
Perlis	70	157	-	227
Pulau Pinang	974	730	8	1,712
Selangor	399	600	-	999
Terengganu	200	981	-	1,181
TOTAL	14,322	16,888	918	32,138

Source: Department of Agriculture, Malaysia 2000

The acreage and value of vegetable crops change primarily according to the increasing population, changing food habits and corresponding demand. It is estimated that there were at least 10,000 plant species used as vegetables worldwide, but less than 50 plant species are of great commercial value. Table 1.2 shows that the principle vegetables types and species grown in Malaysia, ranked according to its group total hectares in 1998. The most popular planted fruit vegetables were long bean (3,560 hectares), cucumber (3,192 hectares) and chilli (2,661 hectares). For leafy vegetables, leaf mustard has the bigger planted are (2,402 hectares), followed by Chinese Spinach (1,497 hectares) and water spinach (1,424 hectares). Consumer preference will continue to change the relative important type of different vegetables to be grown by the farmers.

In Malaysia however, there are still a lot of farmers who own an uneconomical farm size to cultivate their crops. Moreover, vegetables are still considered as smallholder crops and the average farm size owned by farmers in Peninsular Malaysia is 0.8 hectare (FAMA, 1992). The majority of land holdings are well below the existing definition of economically viable sizes of about 3 hectares for the crops.

Table 1.2: Hectares of Vegetables by Type, Peninsular Malaysia 1999

Vegetables Types	Hectareage(Ha)
<u>Fruit vegetables:</u>	
Long Bean	3,560
Cucumber	3,192
Chilli	2,661
Lady's Finger	1,559
Brinjal	1,428
Angled Loofah	1,166
French Bean	1,115
Bitter Ground	945
Tomatoes	470
Pumpkin	261
Sweet pepper	172
Bottle Gourd	110
Others (e.g: Four Angled Bean, Wax Gourd)	254
<u>Leafy vegetables:</u>	
Leaf Mustard	2,402
Chinese Spinach	1,497
Water Spinach	1,424
Chinese White Cabbage	1,415
Lettuce	1,272
Dwarf White Mustard	978
Chinese Kale	956
Sawi Kerinting	920
Chinese Mustard	674
Cabbage	548
Chinese Cabbage	400
Spring Onion	279
Head Lettuce	230
Sweet Shoot	223
Spinach	179
Others (e.g: Chinese Chives, Celery)	940
<u>Root vegetables:</u>	
Yambean	740
Chinese Radish	170
Carrot	8
TOTAL	32,138

Source: Department of Agriculture, Malaysia 2000

1.1.2 Vegetables Production

The growth in vegetable consumption and production in recent years has been nothing short of phenomenon. While public attention has focused on the more visible expansion in oil palm and cocoa areas, the unnoticed expansion in vegetable cultivation has far eclipsed both areas in its growth rate as health consciousness takes a grip on the people and the consumption of “wholesome, natural” food increased.

In the Second Industrial Master Plan (IMP2), the future structure for vegetables industry will be focused on lowland vegetables and minimal processed products for niche markets and organically or chemically free products to meet the consumers demand. In the domestic market, the per capita consumption of vegetables has increased with the increased population and the standard of living. In 1995, the annual per capita consumption of fresh vegetables was about 48.5 kg in Malaysia compared to 127 kg and 80 kg in Taiwan and USA, respectively. Thus, it shows that the consumption of vegetables in Malaysia is increasing annually.

Despite the stagnation in the plantation area, the demand for vegetables was so strong that the production kept rising. Table 1.3 shows that the trend production of vegetables increases every year. In the period 1990 to 1997, production increased 29.1 percent from 224,00 tonnes to 289,100 tonnes.